INCH-POUND

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DETAIL SPECIFICATION

SANDWICH, SHELF STABLE, FOR OPERATIONAL RATIONS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a shelf stable sandwich in flexible pouches intended for use by the Department of Defense as a component of operational rations.

1.2 Classification. The product will be of the following types as specified (see 6.1):

1.2.1 Types. The types are as follows:

Type I	-	Nacho flavored beef
Type II	-	Pepperoni
Type III	-	Honey barbecue chicken
Type IV	-	Honey barbecue beef
Type V	-	Italian style

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: Commander, US Army Research, Development & Engineering Command, Natick Soldier Research, Development and Engineering Center, RDNS-CFF, 15 Kansas Street, Natick, MA 01760-5056 or emailed to melvin.l.carter6.civ@mail.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

AMSC N/A FSC 8940

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. None.

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

Institutional Meat Purchase Specifications (IMPS) for Sausage Products Series 800

Meat and Poultry Inspection Regulations (9 CFR Parts 300-599)

U.S. Standards for Grades of Canned Tomato Paste

U.S. Standards for Grades of Olive Oil

(Copies of these documents are available online from www.usda.gov or from Superintendent of Documents, ATTN: New Orders, P. O. Box 371954, Pittsburgh, PA 15250-7954.)

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder (21 CFR Parts 1-199)

(Copies of this document are available online from www.access.gpo.gov/nara or from the Superintendent of Documents, ATTN: New Orders, P.O. Box 371954, Pittsburgh, PA 15250-7954.)

U.S. ENVIRONMENTAL PROTECTION ACENCY (EPA)

National Primary Drinking Water Regulations

(Copies of this document are available from www.epa.gov or from the Office of Drinking Water, Environmental Protection Agency, WH550D, 401 M Street, SW, Washington, DC 20460.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AOAC INTERNATIONAL

Official Methods of Analysis of the AOAC International

(Copies of this document are available from www.aoac.org or AOAC International, 481 North Frederick Avenue, Suite 500, Gaithersburg, MD 20877.)

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC)

Approved Methods of the American Association of Cereal Chemists

(Copies of this document are available from www.aaccnet.org or American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121.)

AMERICAN DEHYDRATED ONION AND GARLIC ASSOCIATION (ADOGA)

Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products

(Copies of this document are available from www.CLFP.com or American Dehydrated Onion and Garlic Association, 980 9th Street Suite 230, Sacramento, CA 95814.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQCZ1.4 Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document are available from www.asq.org or ASQ, 600 North Plankinton Ave., Milwaukee, WI 53203.)

NATIONAL ACADEMY OF SCIENCES

Food Chemicals Codex

(Copies of this document are available from www.nap.edu or National Academy Press, 2101 Constitution Avenue, N.W. Washington, DC 20418.)

NORTH AMERICAN MEAT PROCESSORS ASSOCIATION (NAMP)

Meat Buyers Guide

(Copies of this document are available from www.namp.com or North American Meat Processors Association, 1910 Association Drive, Reston, VA 20191.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Product standard. When specified (see 6.1), a sample shall be subjected to first article (FA) or product demonstration model (PDM) inspection as applicable, in accordance with 4.2. The approved sample shall serve as the product standard. Should the contractor at any time plan to, or actually produce the product using different raw material or process methodologies from the approved product standard, which result in a product non comparable to the product standard, the contractor shall submit a replacement FA or PDM for approval. In any event, all product produced must meet all requirements of this document including product standard comparability.

3.2 Ingredients. All ingredients shall be clean, sound, wholesome, and free from foreign material, evidence of rodent or insect infestation, extraneous material, off-flavors, off-odors, and off-colors. All ingredients shall meet and be in accordance with good commercial manufacturing practices.

3.2.1 Ingredients for bread.

3.2.1.1 Flour. The flour shall be matured, bleached, enriched, hard wheat flour, which will produce a product in compliance with 3.5. Alternatively, unenriched flour may be used provided the equivalent enrichments required in the Code of Federal Regulations (CFR) for Standard of Identity for Enriched Flour (21 CFR, Part 137.165) are added at the time of production of the finished product. The flour used for preparation of the dough shall have a protein content of not less than 12.5 percent. Amylolytic enzyme activity, as determined by the "falling number" method shall not be less than 225. Flour not meeting protein requirements but otherwise in compliance may be supplemented with vital wheat gluten to the required protein level.

3.2.1.2 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

3.2.1.3 Shortening. The shortening shall be refined, hydrogenated vegetable oil or a combination of refined, hydrogenated vegetable oils which are commonly used by the baking industry and shall have a stability of not less than 100 hours as determined by the active oxygen method (AOM) or a free fatty acid content of less than or equal to 0.04. Shortening used for greasing dough trough, dough pieces, or baking molds shall conform to the above requirements.

3.2.1.4 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.1.5 Yeast. Yeast shall be active dry baker's yeast. Compressed yeast shall not be used.

3.2.1.6 Salt. Salt shall be iodized, white, refined sodium chloride with or without anti-caking agents.

3.2.1.7 Emulsifier. The emulsifier shall be sucrose fatty acid esters complying with the 21 CFR, Part 172.859 and shall be limited to sucrose ester stearate having an Hydrophilic-Lipophilic Balance (HLB) number of approximately 16 (see 6.2.1).

3.2.1.8 Gum arabic. Gum arabic shall comply with the Food Chemicals codex and shall have been produced from a solution of gum arabic which has been sprayed dried.

3.2.1.9 Calcium sulfate. The calcium sulfate shall comply with the Food Chemicals Codex.

3.2.1.10 Xanthan gum. Xanthan gum shall comply with the Food Chemicals Codex.

3.2.1.11 Glucono-delta lactone, encapsulated. Encapsulated glucono-delta-lactone shall comply with the Food Chemicals Codex. The encapsulated glucono-delta-lactone shall consist of 70 $\pm$ 2 percent glucono-delta-lactone and 30 $\pm$ 2 percent vegetable oil. The vegetable oil shall have a melting point of 141°F to 147°F (60º C to 64ºC) (see 6.2.2).

3.2.1.12 Sorbic acid, encapsulated. Encapsulated sorbic acid shall comply with the Food Chemicals Codex. The encapsulated sorbic acid shall consist of 70 $\pm$ 2 percent sorbic acid and 30 $\pm$ 2 percent vegetable oil. The vegetable oil shall have a melting point of 141°F to 147°F (61ºC to 64ºC) (see 6.2.3).

3.2.1.14 Vital wheat gluten. Vital wheat gluten shall be a cream to tan colored powder produced from wheat flour by drying freshly washed gluten under temperatures sufficiently low to preserve the vital characteristics of gluten. Vital wheat gluten shall have a protein content (N x 5.7) of not less than 71.0 percent and a moisture content of not more than 6.5 percent.

3.2.1.15 Oxidizer/conditioner/mix reducer. The Oxidizer/conditioner/mix reducer shall be Im-Prove 200 or equal complying with the Food Chemicals Codex (see 6.2.5).

3.2.2 Ingredients for meat product used in types I and II filling.

3.2.2.1 Nacho flavored beef stick. The nacho cheese flavored beef stick filling shall be not more than 3.5 inches long or more than 1.0 inches in diameter. The stick shall have a weight not less than 0.8 ounces (22 grams). It shall have a pH of less than or equal to 4.8 and a water activity of less than or equal to 0.89 (see 6.2.6).

3.2.2.2 Pepperoni stick. The pepperoni stick filling shall be not more than 3.5 inches long or more than 1.0 inches in diameter. The stick shall have a weight not less than 0.8 ounces (22

grams). It shall have a pH of less than or equal to 4.8 and a water activity of less than or equal to 0.89 (see 6.2.7).

3.2.3 Ingredients for honey barbecue sauce for types III and IV filling.

3.2.3.1 Tomato paste. Tomato paste shall be Grade A as defined by the U.S. Standards for Grades of Canned Tomato Paste.

3.2.3.2 Sugar, brown, light. Brown sugar shall be refined cane or beet sugar. The sugar shall be light brown in color and shall possess a sweet, molasses-like flavor.

3.2.3.3 Salt. Salt shall be iodized, white, refined, sodium chloride, with or without anticaking agent.

3.2.3.4 Sauce, Worcestershire. Worcestershire sauce shall be brown to dark brown liquid and shall possess a pleasant, tart, peppery fruit-spice flavor with a typical heavy viscosity. The titratable acidity (as acetic acid) of the sauce shall be not less than 2.8 percent or more than 3.3 percent.

3.2.3.5 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.3.6 Onion, dehydrated, chopped. Dehydrated chopped onions shall be Fancy Grade of the Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products.

3.2.3.7 Flavoring, smoke. Smoke flavoring shall be an aqueous solution of natural maple and/or oak wood smoke and shall be dark brown-black in color with a clean smoke odor. The smoke flavoring shall have a titratable acidity of 6.2 to 7.2 percent (expressed as acetic acid), a carbonyl level (butanone-2) of 7.0 to 8.0 grams per 100 mL and the smoke flavoring compounds (phenols) shall be 6.0 to 9.0 mg per mL (see 6.2.8).

3.2.3.8 Pepper, red, ground. Ground red pepper shall be derived from red, ripe fruit of *Capsicum fructesens L*. and shall possess the characteristic yellowish-red to red color. The Scoville Pungency Value shall be not less than 30,000 units. The red pepper shall be uniformly ground to allow a minimum of 95 percent, by weight, to pass through a U.S. Standard No. 40 sieve, and not less than 95 percent, by weight, to be retained on a U.S. Standard No. 60 sieve.

3.2.3.9 Garlic powder. Garlic powder shall be Fancy Grade of the Official Standards and methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products.

3.2.3.10 Oil, vegetable. Vegetable oil shall possess a clean, bland, flavor and shall have a minimum stability of 25 hours (AOM). The oil shall have a free fatty acid value not to exceed

0.05 percent, a moisture/volatile matter content not to exceed 0.06 percent and pass a cold test of 5.5 hours (minimum).

3.2.3.11 Yellow mustard. The prepared mustard shall be a smooth paste of yellow mustard seed, vinegar, water, tumeric, and seasonings such as salt, clove and coriander.

3.2.3.12 Molasses. Sugarcane molasses shall be what is commonly called dark molasses. The molasses shall have a brix not less than 77 degrees Brix, total sugar not less than 58 percent, ash not more than 9 percent, and total sulfites not more than 250 ppm.

3.2.3.13 Pepper, black, ground. Ground black pepper shall have been ground from the deep brown to black, deep-set wrinkled, immature berries of *Piper nigrum L*. The ground pepper shall have a characteristic, penetrating odor, a hot biting pungent flavor and a light gray to speckled black-gray color. The ground pepper shall contain not less than 2.0 ml of volatile oil per 100 grams of ground black pepper and be of such size that 95 percent shall pass through a U.S. Standard No. 16 sieve.

3.2.3.14 Encapsulated vinegar powder. Encapsulated vinegar powder shall comply with the Food Chemicals Codex. The encapsulated vinegar powder shall consist of 58 to 62 percent vinegar powder and 38-42 percent vegetable oil. The vegetable oil shall have a melting point of 150°F to 158°F (66ºC to 70ºC). The encapsulated vinegar powder shall have a 5 percent maximum on #14 Mesh Screen (USSS) (see 6.2.9).

3.2.3.15 Honey. The honey shall be pure high commercial grade and shall be free of any off flavor or off odor.

3.2.3.16 Ground mustard. Mustard flour shall be a bright yellow powder from a blend derived from the endosperm of the seed of *Brassicca hirta* and *Brassica junca*. Mustard flour shall contain not less than 0.4 ml volatile oil per 100 grams of mustard flour and be of such size that not less than 95 percent shall pass through a U.S. Standard No. 60 sieve.

3.2.4 Ingredients for chicken used in type III.

3.2.4.1 Chicken breast. Raw (uncooked), skinless, boneless chicken breast shall be prepared from freshly slaughtered broiler/fryer chickens (2.5 to 3.75 lb range) in accordance with USDA Poultry Products Inspection regulations. The chicken breasts shall be U.S. Grade A. The chicken breasts shall have no bone or bone fragments over 0.3 inch. The chicken breast shipped between plants shall be accompanied by a USDA Poultry Products Grading Certificate to certify quality, class, weight range requirements, and condition of the product and either the initial chilling date or initial freezing (in-storage) date.

3.2.4.2 Chicken thighs. Raw (uncooked), skinless, boneless chicken thighs shall be prepared from freshly slaughtered broiler/fryer chickens in accordance with USDA Poultry Products

Inspection regulations. The chicken thighs shall be U.S. Grade A. The chicken thighs shall have no bone or bone fragments over 0.3 inch. Excess fat must be removed from the meat before use. The chicken thighs shipped between plants shall be accompanied by a USDA Poultry Products Grading Certificate to certify quality, class, weight range requirements, and condition of the product and either the initial chilling date or initial freezing (in-storage) date.

3.2.4.3 Fat. Excess fat must be removed from the meat before use. Excess fat includes: (a) visible fat not integrated in the muscle tissue that exceeds an aggregate area equivalent to the area of a circle with a diameter of 1.50 inches (3.81 cm); and (b) fat deposit not integrated in the muscle that extends more than 0.50 inches (1.27 cm) beyond the meat tissue.

3.2.4.4 Chicken, chilled. Raw (uncooked), skinless, boneless thighs, whole chicken breast or breast halves received in the chilled state shall not have been previously frozen and shall have been held at the internal temperature of 28ºF to 40ºF (-2ºC to 4ºC) for a period of time not to exceed 6 days following the initial chilling and prior to preparation and further processing.

3.2.4.5 Chicken, frozen. Raw (uncooked), skinless, boneless thighs, whole chicken breast or breast halves received in the frozen state shall have been held at an internal temperature not to exceed 0ºF (-18ºC) for a period of time not to exceed 120 days following initial freezing and prior to preparation and further processing.

3.2.5 Ingredients for beef used in type IV.

3.2.5.1 Beef, frozen. Raw (uncooked) beef shall be from knuckles (North American Meat Processors Association (NAMP) 167) or bottom rounds (NAMP 170) and have all surface fat removed. The beef shall be free of heavy connective tissue. The beef shall have been held at an internal temperature not to exceed 0ºF (-18ºC) for a period of time not to exceed 120 days following initial freezing and prior to preparation and further processing. The frozen beef shall be certified by the vendor (CoC) identifying the beef cut NAMP, freezing date and processing requirements.

3.2.6 Ingredients for marinating sauce used in types III and IV.

3.2.6.1 Broth, beef. The dry, canned (thermostabilized) or frozen beef broth shall be produced from USDA inspected beef in accordance with the USDA Meat and Poultry Products Inspection Regulation. The canned or frozen beef broth shall be free from extraneous material and crackling. The broth shall have a characteristic mild-beef broth odor and flavor and may contain flavor enhancer approved by the FDA. The frozen beef broth shall have been held at 0ºF (-18ºC) or below for not more than 75 days from date of freezing.

3.2.6.2 Broth, chicken. The dry, canned (thermostabilized) or frozen chicken broth shall be produced from USDA inspected chicken in accordance with the USDA Poultry Products Inspection Regulation. The broth shall have a characteristic mild-chicken broth odor and flavor

and may contain flavor enhancer approved by the FDA. The frozen chicken broth shall have been held at 0ºF (-18ºC) or below for not more than 75 days from date of freezing.

3.2.6.3 Rice syrup, clarified. The rice syrup should be a clarified low conversion rice syrup. The syrup shall have a sweet taste, and gold to amber color. It shall have a pH of 6.0 to 6.6, a clarity (5 percent, 800 nm) not greater than 85 percent transmission and a minimum brix of 77 degrees Brix. The clarified rice syrup shall have a dextrose equivalent (DE) of 26. (see 6.2.10).

3.2.6.4 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.6.5 Pepper, black, ground. Ground black pepper shall have been ground from the deep brown to black, deep-set wrinkled, immature berries of *Piper nigrum L*. The ground pepper shall have a characteristic, penetrating odor, a hot biting pungent flavor and a light gray to speckled black-gray color. The ground pepper shall contain not less than 2.0 ml of volatile oil per 100 grams of ground black pepper and be of such size that 95 percent shall pass through a U.S. Standard No. 16 sieve.

3.2.6.6 Sodium tripolyphosphate. The sodium tripolyphosphate shall comply with the Food Chemicals Codex.

3.2.7 Ingredients for Italian tomato sauce for type V filling.

3.2.7.1 Tomato paste. Tomato paste shall be Grade A as defined by the U.S. Standards for Grades of Canned Tomato Paste.

3.2.7.2 Tomatoes, crushed, canned. Canned tomatoes shall be peeled, cored, mature, crushed tomatoes. The use of safe and suitable firming and acidification ingredients and salt is permitted. The canned tomatoes shall have not less than 8.0 percent tomato soluble solids and shall possess a red flesh color, normal character, and a good distinct acid sweet tomato flavor and odor. The crushed tomatoes shall be free of extraneous vegetable material and objectionable core material and skins (peel). The canned, crushed tomatoes shall be of the latest season's pack.

3.2.7.3 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.7.4 Cheese, blend, Parmesan/Romano grated. The cheese blend shall comply with 21 CFR Part 133; section 133.146 Grated cheeses, section 133.165 Parmesan and Reggiano cheese, and section 133.183 Romano cheese.

3.2.7.5 Olive oil. Olive oil shall be U.S. Grade A of the U.S. Standards for Grades of Olive Oil.

3.2.7.6 Sugar, white, granulated. Sugar shall be white, refined, granulated cane or beet sugar, or a combination thereof.

3.2.7.7 Garlic powder. Garlic powder shall be Fancy Grade of the Official Standards and methods of the American Dehydrated Onion and Garlic Products.

3.2.7.8 Onion, dehydrated, chopped. Dehydrated chopped onions shall be Fancy Grade of the Official Standards and Methods of the American Dehydrated Onion and Garlic Association for Dehydrated Onion and Garlic Products.

3.2.7.9 Salt. Salt shall be iodized, white, refined, sodium chloride, with or without anticaking agent.

3.2.7.10 Oregano, ground. Ground oregano shall be derived from the dried leaves of *Origanum vulgare L*. and shall have a strong camphoraceous aroma and a pungent, slightly bitter flavor. Volatile oil content shall be not less than 2.0 mL per 100 grams and the oregano shall be of such size that not less than 95 percent shall pass through a U.S. Standard No. 30 sieve.

3.2.7.11 Fennel, ground. Ground fennel shall be derived from the clean ripe fruit of *Foeniculum vulgare Mill*. The ground fennel shall be light green-brown to a yellow-brown in color and possess a pleasant aromatic odor with a flavor resembling that of anise. A minimum of 95 percent by weight shall pass through a U.S. Standard No. 25 sieve. The volatile oil content shall be not less than 1.0 mL per 100 grams.

3.2.7.12 Basil, ground. Ground basil shall be derived from the dried leaves of *Ocimum basilicum L*. and shall possess a sweet, anise-like odor, and aromatic, warm, slightly pungent flavor. The volatile oil content shall be not less than 0.4 mL per 100 grams of ground basil. A minimum of 95 percent, by weight, shall pass through a U.S. Standard No. 35 sieve.

3.2.7.13 Pepper, white, ground. Ground white pepper shall have been ground from immature berries of *Piper nigrum L*. from which the outer covering or the outer and inner covering have been removed and shall possess a characteristic, penetrating odor, a hot biting pungent flavor and a cream white color.

3.2.7.14 Thyme, ground. Ground thyme shall be derived from leaves and flowering tops of *Thymus vulgaris L* and shall possess a fragrant aromatic odor and aromatic, minty, flavor and brown-green color.

3.2.7.15 Bay leaves, ground. Ground bay leaves shall be derived from the dried leaves of *Laurus nobilis L*, and shall possess a pleasant, aromatic odor and pungent, mildly bitter flavor with a pale green to yellow-green color. The volatile oil content shall be not less than 1.0 mL per 100 grams of ground bay leaves. A minimum of 95 percent, by weight, shall pass through a U.S. Standard No. 30 sieve.

3.2.7.16 Pepper, red, ground. Ground red pepper shall be derived from red, ripe fruit of

Capsicum fructesens L. and shall possess the characteristic yellowish-red to red color. The Scoville Pungency Value shall be not less than 30,000 units. The red pepper shall be uniformly ground to allow a minimum of 95 percent, by weight, to pass through a U.S. Standard No. 40 sieve, and not less than 95 percent, by weight, to be retained on a U.S. Standard No. 60 sieve.

3.2.7.17 Mozzarella cheese powder. The Mozzarella cheese powder shall be off white, creamy and mild flavored. It shall have a maximum moisture of 3.5 percent and a minimum fat of 31.5 percent. The powder shall be free from hard lumps and 100 percent through a U.S. Standard No. 12 sieve.

3.2.7.18 Pre-blended spice and seasoning mix. Pre-blended spices and seasonings may be used. The spices and seasonings in the mix shall comply with the individual requirements specified in this specification. The ingredients shall be in the same proportions as specified in the spice and seasoning mix formula.

3.2.8 Ingredients for meat used in type V.

3.2.8.1 Italian sausage, sweet, bulk, uncooked. The sweet Italian sausage shall comply with the Institutional Meat Purchase Specifications (IMPS) Item No. 818: Italian Sausage, Formula D, Flavor B, Type F, Cooking option C.

3.2.8.2 Pepperoni, diced. The diced pepperoni shall comply with the IMPS Item No. 821 Pepperoni, Formula B. The diced pepperoni shall be pieces typically produced by a 1/2 inch machine setting.

3.2.9 Ingredients for marinating sauce used in type V.

3.2.9.1 Rice syrup, clarified. The rice syrup should be a clarified low conversion rice syrup. The syrup shall have a sweet taste, and gold to amber color. It shall have a pH of 6.0 to 6.6, a clarity (5 percent, 800 nm) not greater than 85 percent transmission and a minimum Brix of 77 degrees Brix. The clarified rice syrup shall have a dextrose equivalent (DE) of 26. (see 6.2.10).

3.2.9.2 Glycerol. The glycerol shall comply with the Food Chemicals Codex.

3.2.9.3 Water. Water used for formulation and washing shall conform to the National Primary Drinking Water Regulations.

3.2.9.4 Salt. Salt shall be iodized, white, refined, sodium chloride, with or without anti-caking agent.

3.3 Preparation and processing.

3.3.1 Preparation and processing of meat mixtures.

3.3.1.1 Preparation and processing of meat used in Types III and IV. The chicken or beef shall be formulated from the following ingredients in the proportions specified:

Ingredient	Percent by weight
Chicken or beef 1/	86.06
Chicken or beef broth	4.7
Rice syrup	3.7
Glycerol	3.7
Salt	1.3
Sodium tripolyphosphate	0.36
Black pepper	0.18

1/ The chicken shall consist of 90 percent skinless, boneless chicken breast and 10 percent skinless, boneless chicken thighs.

a. The chicken mixture shall be prepared as follows:

(1) The chicken shall be tempered to a temperature to facilitate processing not to exceed 40°F (4°C) then flaked through a Comitrol-in order to achieve a coarse grind thru a 3/8 inch plate.

(2) Combine the marinade ingredients. The chicken shall be mixed with marinade and marinated for 24 hours under refrigeration 40°F or lower (4ºC or lower). An alternative to marinating overnight is to vacuum infuse the marinade with the meat in a vacuum tumbler. Infusion parameters shall replicate a 24 hour marinade and have been successfully accomplished in a 25 minute, 25 rpm, 27 mmHg process schedule.

(3) After marinating or vacuum infusion, the chicken mixture shall be cooked in a steam jacketed kettle or equivalent to a targeted water activity less than or equal to 0.94. The filling shall be mixed intermittently to ensure chicken pieces are less than 1/2 inch, but not ground. Excess moisture should be drained or cooked off from the cooked chicken mixture until the target water activity is met.

(4) If the process is not continuous, the cooked chicken mixture shall be cooled to a temperature of 72°F (22°C) within 2 hours and to 40°F (4°C) within 4 hours following the cooking process. The cooled, cooked chicken mixture shall be held for not more than 24 hours at a temperature of 28°F to 40°F (-2°C to 4°C) after removal from the cooking process and prior to mixing with barbecue sauce.

b. The beef mixture shall be prepared as follows:

(1) The frozen beef shall be tempered to a temperature to facilitate shaving not to exceed

40°F (4°C). Beef shaved between 1/32 to 2/32 inches has been shown to meet end item requirements. After shaving the beef shall be tempered to 28°F to 40°F (-2°C to 4°C) prior to marinating.

(2) Combine the marinade ingredients. The beef shall be mixed with marinade and marinated for 24 hours under refrigeration 40°F or lower (4ºC or lower). An alternative to marinating overnight is to vacuum infuse the marinade with the meat in a vacuum tumbler. Infusion parameters shall replicate a 24 hour marinade and have been successfully accomplished in a 25 minute, 25 rpm, 27 mmHg process schedule.

(3) After marinating or vacuum infusion, the meat mixture shall be cooked in a steam jacketed kettle or equivalent to a targeted water activity of less than or equal to 0.94. Excess moisture should be drained or cooked off from the cooked beef until the target water activity is met.

(4) If the process is not continuous, the cooked beef mixture shall be cooled to a temperature of 72°F (22°C) within 2 hours and to 40°F (4°C) within 4 hours following the cooking process. The cooled, cooked beef mixture shall be held for not more than 24 hours at a temperature of 28°F to 40°F (-2°C to 4°C) after removal from the cooking process and prior to mixing with barbecue sauce.

3.3.1.2 Preparation and processing of meat used in type V. The Italian sausage shall be formulated from the following ingredients in the proportions specified:

Ingredient	Percent by weight
Italian sausage, sweet	80.0
Rice syrup	9.0
Water	5.0
Glycerol	5.0
Salt	1.0

a. The Italian sausage mixture shall be prepared as follows:

(1) Combine the marinade ingredients. The Italian sausage shall be mixed with marinade and marinated for 24 hours under refrigeration 40°F or lower (4ºC or lower). An alternative to marinating overnight is to vacuum infuse the marinade with the meat in a vacuum tumbler. Infusion parameters shall replicate a 24 hour marinade and have been successfully accomplished in a 25 minute, 25 rpm, 27 mmHg process schedule.

(2) After marinating or vacuum infusion, the Italian sausage mixture shall be cooked in a steam jacketed kettle or equivalent to a targeted water activity of less than or equal to 0.92. The filling shall be mixed intermittently to ensure Italian sausage pieces are less than 1/2 inch, but

not ground. Excess moisture should be drained or cooked off from the cooked sausage until the target water activity is met.

(3) If the process is not continuous, the cooked Italian sausage shall be cooled to a temperature of 72°F (22°C) within 2 hours and to 40°F (4°C) within 4 hours following the cooking process. The cooled, cooked Italian sausage mixture shall be held for not more than 24 hours at a temperature of 28°F to 40°F (-2°C to 4°C) after removal from the cooking process and prior to mixing with Italian sauce.

3.3.2 Preparation of sauces or fillings.

3.3.2.1 Preparation of honey barbecue sauce. The honey barbecue sauce shall be formulated with the following ingredients in the proportions specified:

Ingredient	Percent by weight
Tomato paste	35.98
Brown sugar	14.9
Yellow mustard	11.7
Honey	10.4
Glycerol	7.7
Molasses	5.94
Ground mustard	3.7
Vegetable oil	3.1
Salt	2.0
Worcestershire sauce	2.0
Onions (dehydrated)	1.54
Smoke (liquid base)	0.6
Garlic powder	0.4
Red pepper	0.06
Black pepper	0.06

The sauce ingredients shall be mixed together and heated to a temperature of 140ºF to 180ºF (60ºC to 82ºC), and cooked continuously until a targeted water activity of less than or equal to 0.86 is reached.

3.3.2.2 Preparation of filling (types III and IV). The filling shall be prepared as follows:

Ingredient	Percent by weight
Barbecue sauce	54.1
Marinated/cooked chicken or beef	44.3
Encapsulated vinegar powder	1.6

a. The cooked chicken or beef shall be mixed with the barbecue sauce and encapsulated vinegar. Temperature shall be less than 135ºF (57ºC) before adding encapsulated vinegar. The water activity of the final mixture shall be less than or equal to 0.91 and the pH of the mixture shall be less than or equal to 5.0.

b. If the mixture is not going to be used immediately, the meat/barbecue sauce mixture shall be held at 40ºF (4ºC) or less for not more than 48 hours or frozen to 0ºF (-18ºC) or below within 72 hours and held for not more than 60 days. The meat/barbecue sauce mixture shall be stored in containers that are adequate to protect from freezer deterioration/damage and maintain the product in excellent condition.

3.3.2.3 Preparation of Italian sauce. The Italian tomato sauce shall be formulated with the following ingredients in the proportions specified:

Ingredients	Percent by weight
Tomato paste	39.05
Crushed tomatoes	29.7
Glycerol	12.3
Olive oil	3.5
Parmesan/Romano cheese	5.6
Onion (dehyd/chopped)	1.8
Sugar	2.2
Salt	1.3
Garlic powder	2.1
Oregano (ground)	0.6
Fennel (ground)	0.3
Basil (ground)	0.3
White pepper	0.1
Thyme (ground)	0.1
Bay leaves (ground)	0.1
Pepper, red ground	0.05

The sauce ingredients shall be mixed together and heated to a temperature of 140ºF to 180ºF (60ºC to 82ºC) and cooked continuously until a targeted water activity of less than or equal to 0.90 is reached.

3.3.2.4 Preparation of filling type V. The filling shall be prepared as follows:

Ingredients	Percent by weight
Italian tomato sauce	46.8
Marinated/cooked sausage	28.2
Diced pepperoni	22.2
Mozzarella cheese powder	2.8

a. The marinated/cooked sausage shall be mixed with the Italian tomato sauce, diced pepperoni and mozzarella cheese powder. The water activity of the final mixture shall be less than or equal to 0.89 and the pH of the mixture shall be less than or equal to 5.0.

b. If the process is not continuous, the mixture shall be held at 40ºF (4ºC) or less for not more than 48 hours or frozen to 0ºF (-18ºC) or below within 72 hours and held for not more than 60 days. The mixture shall be stored in containers that are adequate to protect from freezer deterioration/damage and maintain the product in excellent condition.

3.3.3 Preparation of bread.

3.3.3.1 Preparation of bread for types I, II and V. The bread shall be formulated from the following ingredients in the proportions specified:

	I and II	V
Ingredient	Percent by weight	Percent by weight
Flour, bread 1/	51.05	49.75
Water 1/	27.4	28.8
Shortening	8.7	8.7
Glycerol	6.4	6.4
Yeast (instant dry) 1/	2.3	2.3
Salt	1.3	1.3
Sucrose ester	1.0	1.0
Oxidizer/conditioner/mix reducer	0.5	0.5
Gum arabic	0.5	0.5
Calcium sulfate	0.25	0.25
Xanthan gum	0.25	0.25
Glucono delta lactone, encapsulated	0.25	0.15
Sorbic acid, encapsulated	0.10	0.10

1/ The percent by weight of flour, water, and yeast, may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

3.3.3.2 Preparation of bread for types III and IV. The bread shall be formulated from the following ingredients in the proportions specified:

Ingredient	Percent by weight
Flour, bread 1/	50.1
Water 1/	28.8
Shortening	8.6
Glycerol	6.3
Yeast (instant dry) 1/	2.3
Salt	1.3
Sucrose ester	1.0
Oxidizer/conditioner/mix reducer	0.5
Gum arabic	0.5
Calcium sulfate	0.25
Xanthan gum	0.25
Sorbic acid, encapsulated	0.10

1/ The percent by weight of flour, water, and yeast may be adjusted, if necessary, to compensate for in-plant processing equipment, humidity and temperature conditions.

3.3.3.3 Preparation of dough. The bread shall be manufactured by the sponge and dough method or any other method yielding an equivalent product. Commonly used dough improvers, yeast foods and/or dough relaxers are permitted. The sucrose ester emulsifier shall be dry blended with the flour. All ingredients shall then be combined and sufficiently mixed to develop the dough. Relax dough prior to sheeting.

3.3.4 Preparation of sandwich.

3.3.4.1 Sheeting and forming sandwich. The proofed dough shall be sheeted into pieces of sufficient weight and filled to ensure compliance with finished product net weight requirements. The co-extrusion method may be used as long as all finished product requirements are met.

3.3.4.2 Forming of types I and II sandwiches. Types I and II made with a dough weight of 2.0 ounces (56.7grams) and meat weight of 0.9 ounces (25.5 grams) and a final product weight of 2.9 ounces (82.2 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.4.3 Forming of types III and IV sandwiches. The filling weight shall be a minimum 1.3 ounces (36.8 grams). Types III and IV made with a dough weight of 2.6 ounces (73.7 grams) and filling weight of 1.3 ounces (36.8 grams) and a final product weight of 3.9 ounces (111.0 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.4.3.1 Forming of type V sandwich. The filling weight shall be a minimum 1.3 ounces (36.8 grams). Types V made with a dough weight of 2.6 ounces (73.7 grams) and filling weight of 1.3 ounces (36.8 grams) and a final product weight of 3.9 ounces (111.0 grams) prior to proofing and baking have been shown to meet end item requirement weights.

3.3.4.4 Proofing. The formed sandwiches shall be proofed at 90ºF to 100ºF (32ºC to 38 ºC) and 86 to 90 percent relative humidity for 50 to 60 minutes. Fluctuations due to opening and closing of proof box doors are acceptable as long as end item requirements are met.

3.3.4.5 Baking. The proofed product shall be fully baked to a minimum internal temperature of 185°F (85°C) and until the exterior is a uniform medium golden brown bread crust color.

3.4 Packaging methods. Continuous method shall be used. One unit of sandwich and one package of an FDA approved oxygen scavenger shall be placed into the pouch. The internal temperature of the sandwich shall be not less than 80ºF (27ºC) or greater than 135ºF (57ºC).

3.4.1 Oxygen scavenger. The oxygen scavenger shall be constructed of materials that are safe for direct and indirect food contact, and shall be suitable for use with edible products. The oxygen scavenger shall be in compliance with all applicable FDA regulations.

3.5 Finished product requirements. The finished product shall comply with the following requirements:

a. There shall be no foreign materials such as, but not limited to dirt, insect parts, hair, wood, glass, metal or mold.

b. There shall be no foreign odors or flavors such as, but no limited to burnt, scorched, moldy, rancid, sour or stale.

c. There shall be no color foreign to the product.

d. For types I and II, no individual pouch shall contain less than 2.5 ounces (70.8 grams).

e. For types III, IV or V, no individual pouch shall contain less than 3.5 ounces (99.2 grams).

f. The shelf stable sandwich and the oxygen scavenger shall both be intact.

g. The water activity for any individual pouch shall be not less than 0.84 and not greater than 0.89 when measured at 77º F (25ºC).

h. The oxygen content of the filled and sealed pouches shall not exceed 0.30 percent after 48 hours from time of sealing.

i. ~~For all types I, II, III and IV, the pH shall not exceed 4.8. For type V, the pH shall not exceed 5.2.~~ For all types, the pH shall not exceed 5.2.

j. For all types, the texture of the bread shall not be excessively dry, crumbly or

excessively moist and gummy. The texture of the bread shall be slightly dense and have a uniform cell structure.

k. For all types, the crust color shall be uniform and golden brown, without being excessively light or dark. The crumb shall be white to off white. There shall be no evidence of compression streaks. The filling should not appear to be excessively dark.

l. For types I and II, the meat stick filling shall be moist, slightly chewy and shall not be grainy or excessively dry.

m. For types I and II, the meat stick filling shall be a reddish brown cured meat color and not appear dry or crumbly.

n. For types III, IV and V, the filling shall be moist, very slightly chewy and shall not be pasty or excessively dry.

o. For type III, the chicken shall be less than 1/2 inch pieces.

p. For type I, the nacho flavored beef shall have a slightly spicy, fermented beef nacho cheese odor and flavor. The product shall have a slight smoked and fermented flavor. The bread shall have a slight nacho cheese odor and flavor.

q. For type II, the pepperoni shall have a slightly spicy pepperoni beef odor and flavor. The product shall have a slight fermented flavor. The bread shall have a slight pepperoni odor and flavor.

r. For types III and IV, the product shall have a slightly sweet barbecue, hickory, honey-like odor and flavor. The bread shall have a slight fermented and smoked odor and flavor.

s. For type IV, clumps of beef shavings shall be less than 1/2 inch.

t. For all types, meat shall be free from skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments.

u. For type V, the Italian sausage pieces shall be less than 1/2 inch.

v. For type V, the product shall have an odor and flavor of pepperoni, sausage, cheese, tomato and mild Italian seasonings. The bread shall have a slight fermented and Italian seasonings odor and flavor.

w. For all types, the filling shall be fully enrobed in bread.

3.5.1 Overall appearance and palatability. The finished product shall be equal to or better than the approved product standard sample (see 6.1) in palatability and overall appearance.

3.6 Hazard Analysis Critical Control Point (HACCP) Plan. Prior to the first production, the contractor shall provide a written HACCP plan that is specific to each product type produced. The plan will include a process flow diagram, identification of critical control points and critical limits, as well as specific monitoring procedures, corrective actions, documentation and verification procedures. The following are considered by the product developer to be critical control points: pH, Aw, baking time and temperature, oxygen content of the end-packaged product. If any of these are not addressed in the producers HACCP plan, they will established and documented as manufacturing process controls in their quality system plan. Other critical control points specific to the manufacturers processes will also be included. Specification limits shall not be used as critical limits for the HACCP plan. When calculating critical limits for analytical requirements, the contractor shall provide sufficient tolerance to account for the variation inherent to their process. The HACCP plan must be submitted to the applicable government inspection agency for approval, and must be approved prior to production of any product offered for acceptance. Contractors may be required to provide records of process capabilities study or related production evaluation to validate critical limits.

3.7 Plant qualifications. The meat component and the finished product shall originate and be produced, processed, and stored in plants regularly operating under Meat and Poultry Inspection Regulations of the U.S. Department of Agriculture. The product shall be prepared, processed and packaged in establishments meeting the requirements of 21 CFR, Part 110, “Current Good Manufacturing Practice in Manufacturing, Packaging, or Holding of Human Food,” and the plant sanitation requirements of the appropriate government inspection agency.

3.8 Federal Food, Drug, and Cosmetic Act. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Product standard inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 Product standard inspection. The first article or product demonstration model shall be inspected in accordance with the provisions of this specification and evaluated for overall appearance and palatability. Any failure to conform to the requirements or any appearance or palatability failure shall be cause for rejection of the lot. The approved product standard shall be

used for periodic review evaluations. All food components that are inspected by the USDA shall be subject to periodic review sampling and evaluation. The USDA shall select sample units during production of contracts and submit them to the following address for evaluation:

US Army Research, Development & Engineering Command
Natick Soldier Research, Development and Engineering Center
RDNS-CFF
15 Kansas Street
Natick, MA 01760-5056

One lot shall be randomly selected during each calendar month of production. Six (6) sample units of each item produced shall be randomly selected from that one production lot. The six (6) sample units shall be shipped to Natick within five working days from the end of the production month and upon completion of all USDA inspection requirements. The sample units will be evaluated for the characteristics of appearance, odor, flavor, texture and overall quality.

4.3 Conformance inspection. Conformance inspection shall include the examinations of 4.2.1, 4.3.1, 4.3.2, 4.3.3 and the tests of 4.4.1 through 4.4.3.

4.3.1 Component and material examination. Components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.3.2 Ingredient and component examination. Conformance of ingredients and components to identity, condition, and other requirements specified in 3.2 shall be certified by the ingredient supplier or ingredient manufacturer, and compliance shall be verified by examination of pertinent labels, markings, US Grade Certificates, certificates of analyses, or other such valid documents acceptable to the inspection agency. If necessary, each ingredient shall be examined organoleptically or inspected according to generally recognized test methods such as the standard methods described in the Official Methods of Analysis of the Association of Official Analytical Chemists and in the Approved Methods of the American Association of Cereal Chemists, to determine conformance to the requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient or component lot or of any involved product.

4.3.3 Product examination. The filled and sealed pouches shall be conditioned to 70ºF to 80ºF (21ºC to 27ºC) and examined for the defects listed in table I. The lot size shall be expressed pouches. The sample unit shall be the contents of one pouch. Utilizing the double sampling plans indicated in ANSI/ASQC Z1.4, the inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for minor defects.

TABLE I. Product defects. 1/ 2/

Category		Defect
Major	Minor	
101		Product not type as specified.
102		Pouch does not contain one intact sandwich or does not contain one intact oxygen scavenger. 4/
103		Sandwich bread crumb not white to off white color.
104		Sandwich bread shows evidence of compression streaks.
	201	Sandwich crust color not uniform or not medium golden brown.
	202	Sandwich filling excessively dark.
	203	Filling not fully enrobed in bread.
105		Sandwich bread texture dry, crumbly, or excessively moist or gummy.
106		Sandwich bread texture not slightly dense or not a uniform cell structure.
107		Tear, hole, or open seal in oxygen scavenger.
		Type I
	204	Meat stick filling not moist or not slightly chewy.
108		Meat stick filling grainy or excessively dry.
	205	Meat stick filling not reddish brown cured meat color.
109		Meat stick filling appears dry or crumbly.
110		Nacho flavored beef not a slightly spicy, fermented beef nacho cheese odor or flavor.
111		Sandwich does not have a slight smoked and fermented flavor.
112		Sandwich bread does not have a slight nacho cheese odor or flavor.

TABLE I. Product defects. 1/ 2/ (continued)

Category		Defect
Major	Minor	
	206	Total weight of skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments more than 0.1 ounces.
		Type II
	207	Meat stick filling not moist or not slightly chewy
113		Meat stick filling grainy or excessively dry.
	208	Meat stick filling not reddish brown cured meat color.
114		Meat stick filling appears dry or crumbly.
115		Pepperoni not a slightly spicy pepperoni beef odor or flavor.
116		Sandwich does not have a slight fermented flavor.
117		Sandwich bread does not have a slight pepperoni odor or flavor.
	209	Total weight of skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments more than 0.1 ounces.
		Type III
	210	Chicken pieces in finished sandwich greater than 1/2 inch.
118		Sandwich does not have a slightly sweet barbecue, hickory, honey-like odor or flavor.
119		Sandwich bread does not have a slight fermented and smoked odor or flavor.
120		Sandwich filling not moist or not very slightly chewy.
121		Sandwich filling pasty or excessively dry.
	211	Total weight of skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments more than 0.20 ounces.

TABLE I. Product defects. 1/ 2/ (continued)

Category		Defect
Major	Minor	
		Type IV
122		Beef not shaved or thickness of clumped shaved beef greater than 1/2 inch.
123		Sandwich does not have a slightly sweet barbecue, hickory, honey-like odor or flavor.
124		Sandwich bread does not have a slight fermented and smoked odor or flavor.
125		Sandwich filling not moist or not very slightly chewy.
126		Sandwich filling pasty or excessively dry.
	212	Total weight of skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments more than 0.35 ounces.
		Type V
	213	Italian sausage pieces greater than 1/2 inch.
127		Sandwich does not have a pepperoni, sausage, cheese, tomato or mild Italian seasonings odor or flavor.
128		Bread does not have a slight fermented and Italian seasonings odor or flavor.
129		Filling not moist or not very slightly chewy.
130		Filling pasty or excessively dry.
	214	Total weight of skin, cartilage, coarse connective tissue, tendons or ligaments, glandular material, discolored meat, and bone or bone fragments more than 0.35 ounces.
		Weight
	215	Types I or II, net weight of an individual sandwich less than 2.5 ounces (70.8 grams). 3/
	216	Types III or IV or V, net weight of an individual sandwich less than 3.5 ounces (99.2 grams). 3/

1/ Presence of any foreign materials for example, dirt, insect parts, hair, wood, glass, metal or mold, or any foreign odors or flavors such as, but not limited to burnt, scorched, rancid, sour, or stale or foreign color shall be cause for rejection of the lot.

2/ Product not equal to or better than the approved product standard in palatability or overall appearance shall be cause for rejection of the lot (see 3.5.1).

3/ The net weight of the filled and sealed pouches shall be determined by weighing each sample on a suitable scale tared with a representative empty pouch and one oxygen scavenger. Results shall be reported to the nearest 0.1 ounce or to the nearest 1.0 gram.

4/ Construction of the oxygen scavenger and compliance with FDA regulations will be verified by Certificate of Conformance.

4.4 Tests.

4.4.1 Water activity (Aw) testing. Eight filled and sealed pouches shall be selected at random from the lot regardless of lot size. Water activity shall be determined not less than 4 days but not more than 14 days after baking to allow moisture equilibration in the product. The pouched product shall be individually tested for Aw in accordance with the Official Methods of Analysis of the AOAC method 978.18, using an electric hygrometer system self temperature controlled at 25ºC (77º F) or an equivalent instrument. Each individual sample unit shall be ground prior to Aw analysis. The results of each Aw determination shall be reported to the nearest 0.01. Any test result not conforming to the Aw requirement in 3.5 shall be classified as a critical defect and the lot shall be rejected.

4.4.2 Oxygen content testing. Eight filled and sealed pouches shall be randomly selected from one production lot and individually tested for oxygen content. Testing shall be accomplished after the filled and sealed pouches have been allowed to equilibrate at room temperature for not less than 48 hours from the time of sealing. Test results shall be reported to the nearest 0.01 percent. Any test result not conforming to the oxygen content requirement in 3.5 shall be classified as a major defect and shall be cause for rejection of the lot.

4.4.3 Analytical. The sample to be analyzed shall be a composite of eight filled and sealed pouches which have been selected at random from the lot. The composite sample shall be prepared and analyzed in accordance with the following Official Methods of Analysis of AOAC International (OMA).

Test	Method Number
pH	981.12

The sample shall be ground. Weigh 100 g of sample into a beaker and add 100 mL of CO_2 free water. Mix well with a stirring rod. Let sample rest for 15 – 30 minutes and measure the pH.

Test results of pH value shall be reported to the nearest 0.1. Government verification will be conducted through actual testing by a Government laboratory. Any result not conforming to the pH requirement in 3.5 shall be cause for rejection of the lot.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.1). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Type of product required (see 1.2).
c. When other than first article or product demonstration model are is required (see 3.1).
d. Provisions for approved product standard samples (see 3.5.1)
e. Packaging requirements (see 5.1)

6.2 Ingredient information.

6.2.1 Emulsifier. Sucrose fatty acid ester S-1670, supplied by Mitsubishi International Corporation, 520 Madison Avenue, New York, NY 10022 meets the requirements of 3.2.1.7 and performs satisfactorily in this product.

6.2.2 Glucono-delta-lactone, ecapsulated. Encapsulated Glucon-delta-lactone manufactured by Balchem Corporation, Slate Hill, NY 10973 meets the requirements of 3.2.1.11 and performs satisfactorily in this product.

6.2.3 Sorbic acid, encapsulated. Encapsulated sorbic acid manufactured by Balchem Corporation, Slate Hill, NY 10973 meets the requirements of 3.2.1.12 and performs satisfactorily in this product.

6.2.4 Potassium sorbate, encapsulated. Encapsulated potassium sorbate manufactured by Balchem Corporation, Slate Hill, NY 10973 meets the requirements of 3.2.1.13 and performs satisfactorily in this product.

6.2.5 Oxidizer/conditioner/mix reducer. Im-Prove 200 manufactured by CARAVAN, Totowa, NJ 07512, meets the requirements of 3.2.1.15 and performs satisfactorily in this product.

6.2.6 Nacho flavored beef stick. Nacho flavored beef stick manufactured by Bridgford Foods Corporation, 170 North Green Street, Chicago, IL 60607 meets the requirements of 3.2.2.1 and performs satisfactorily in this product.

6.2.7 Pepperoni stick. Pepperoni stick manufactured by Bridgford Foods Corporation, 170 North Green Street, Chicago, IL 60607 meets the requirements of 3.2.2.2 and performs satisfactorily in this product.

6.2.8 Flavoring, smoke. Charsol C-6 manufactured by Red Arrow Products Company LLC, 12265 Water Street, Manitowoc, WI 54220 meets the requirements of 3.2.3.7 and performs satisfactorily in this product.

6.2.9 Encapsulated vinegar powder. Flavorshure 114 manufactured by Balchem Corporation, Slate Hill, NY 10973 meets the requirements of 3.2.3.14 and performs satisfactorily in this product.

6.2.10 Rice syrup, clarified. White rice syrup (WRSRDCL) or partially polished brown rice syrup (PPRSRDCL) manufactured by California Natural Products Larhrop, CA 95330 meets the requirements of 3.2.6.3 and 3.2.9.1 and performs satisfactorily in this product.

6.3 Deleted.

6.4 Hazard Analysis Critical Control Point Model. Natick Soldier Center - Combat Feeding Directorate has developed a generic Hazard Analysis Critical Control Point (HACCP) Model for Shelf Stable Pocket Sandwiches in order to provide a framework that manufacturers may find helpful as they develop their own plant-process-product specific HACCP plan. Copies of this generic model can be obtained at the following address:

US Army Research, Development & Engineering Command
Natick Soldier Research, Development and Engineering Center
RDNS-CFF
15 Kansas Street
Natick, MA 01760-5056

6.5 Shelf life. This specification covers items where shelf life is a consideration. Specific shelf-life requirements should be specified in the contract or purchase order. The shelf-life codes are contained in the Federal Logistics Information System Total Item Record. Additive information for shelf-life management may be obtained from DoD 4140.27-M; Shelf-life Management Manual, or the designated shelf-life Points of Contact (POC). The POC should be contacted in the following order: (I) the Inventory Control Points (ICPs), and (2) the DoD Service and Agency administrators for the DoD Shelf-Life Program. Appropriate POCs for the DoD Shelf-Life Program can be contacted through the DoD Shelf-Life Management website: htm://www.shelflife.hg.dla.mil/.

6.6 Subject term (key word) listing.

Combat field feeding
Pouch bread

Custodians:
Army - GL
Navy - SA
Air Force - 35

Preparing activity:
Army - GL
(Project 8940-0959)

Review activities:
Army - MD, QM
Navy - MC
DLA - SS

Civil agency:
USDA - FV

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at www.dodssp.daps.mil.

For DLA Troop Support Website Posting

RDNS-CFF 20 December 2012

TO: DLA Troop Support - Subsistence

ES13-012 (DSCP-SS-13-18792); Document change request to MIL-DTL-32141, Sandwich, Shelf Stable, For Operational Rations; to change the pH requirement for Type I, Nacho Flavored Beef, Type II, Pepperoni, Type III, Honey Barbecue Chicken, and Type IV, Honey Barbecue Beef, for use in the First Strike Ration® (FSR™)

1. The vendor is requesting a change to the subject document to change the pH requirement for sandwiches Types I through IV. Currently the pH requirement is not to exceed 4.8 for Types I, II, III, & IV and not to exceed 5.2 for Type V (Italian style) sandwich. The vendor is requesting that the upper limit for pH be raised from 4.8 to 5.1 for sandwich Types I through IV.

2. This request is based on the results of a challenge study entitled, "Challenge Study of Honey Barbecue Beef and Pepperoni Stick, Shelf Stable Sandwiches", dated 17 April 2012. Study results showed that sandwich Type II, Pepperoni and Type IV, Honey Barbecue Beef are microbiologically stable at pH <5.2 and water activity <0.89.

3. A Technical Report (TR-00/003) entitled, “Effect of Water Activity on The Microbiological Stability of Mobility-Enhancing Ration Components”, dated October 1999, provides results of a challenge study showing that sandwich Type I, Nacho Flavored Beef, was stable at all three of the following water activity and pH combinations: (0.9, 4.9), (0.89, 5.3), and (0.86, 5.2).

4. In the Journal of Food Protection, Vol. 73, No. 1, 2010, Pages 140–202 is a Supplement entitled, “Parameters for Determining Inoculated Pack/Challenge Study Protocols”. This Supplement, on Page 155, Section 12.0, Part 3, discusses limitations for applying the results of an inoculated/pack challenge study conducted on one food to another similar food. It says that challenge studies on one product may sometimes be applicable to other products if there is no significant differences between their intrinsic properties. Nevertheless, an expert microbiologist should make the determination of applicability of one challenge study to additional products. A Senior Microbiologist at the NSRDEC has determined that the Type III, Honey Barbecue Chicken, is similar in composition (e.g., protein content, carbohydrate source, type of organic acid, fat, and moisture), ingredient formulation, processing procedures, water activity, and pH to the Type IV, Honey Barbecue Beef. Therefore, Natick concurs that the challenge study conducted specific for Type IV, Honey Barbecue Beef, can apply to the Type III, Honey Barbecue Chicken.

RDNS-CFF
SUBJECT: ES13-012 (DSCP-SS-13-18792); Document change request to MIL-DTL-32141, Sandwich, Shelf Stable, For Operational Rations; to change the pH requirement for Type I, Nacho Flavored Beef, Type II, Pepperoni, Type III, Honey Barbecue Chicken, and Type IV, Honey Barbecue Beef, for use in the First Strike Ration® (FSR

5. Natick concurs with the vendors request except that we recommend that the upper limit requirement for pH be raised from 4.8 to 5.2 in MIL-DTL-32141, Sandwich, Shelf Stable, For Operational Rations, for Type I, Nacho Flavored Beef, Type II, Pepperoni, Type III, Honey Barbecue Chicken, and Type IV, Honey Barbecue Beef, for use in the First Strike Ration® (FSR™). This pH level ensures food safety and product quality.

6. Natick submits the following change to subject document for all current, pending and future procurements until the document is formally amended or revised:

Page 18, paragraph 3.5., i.; Delete “For types I, II, III and IV, the pH shall not exceed 4.8. For type V, the pH shall not exceed 5.2.” and insert “For all types, the pH shall not exceed 5.2.”

7. Attached is Change 11, MIL-DTL-32141, Sandwich, Shelf Stable, For Operational Rations dated 20 December 2012, with changes highlighted.